

WHAT IS CLAIMED IS:

1 1. A driving method for a color liquid crystal display  
2 comprising:

3 a step of applying gamma compensations making suitable to  
4 a red transmittance characteristic, a green transmittance  
5 characteristic and a blue transmittance characteristic for an  
6 applied voltage of said color liquid crystal display to a video  
7 red signal, a video green signal and a video blue signal  
8 independently in order to obtain a compensated video red signal,  
9 a compensated video green signal and a compensated blue signal;  
10 and

11 a step of driving said color liquid crystal display based  
12 on said compensated video red signal, said compensated video green  
13 signal and said compensated blue signal.

1 2. The driving method for the color liquid crystal display  
2 according to Claim 1, wherein said gamma compensations are applied  
3 using a common voltage or a common data to said video red signal,  
4 said video green signal and said video blue signal corresponding  
5 to an area in which said red transmittance characteristic, said  
6 green transmittance characteristic and said blue transmittance  
7 characteristic for said applied voltage for said color liquid  
8 crystal display become an approximate similar characteristic  
9 curve.

1 3. The driving method for the color liquid crystal display  
2 according to Claim 1, wherein voltages or data used for said gamma  
3 compensations are independently set in an area from a minimum

09707816 110700

sub  
CS

4 transmittance to a maximum transmittance of each of said red  
 5 transmittance characteristic, said green transmittance  
 6 characteristic and said blue transmittance characteristic for  
 7 said applied voltage for said color liquid crystal display.

1 4. The driving method for the color liquid crystal display  
 2 according to Claim 3, wherein said voltages or said data are  
 3 independently changeable.

1 5. A driving method for a color liquid crystal display  
 2 comprising:  
 3 a step of applying gamma compensations, each of said gamma  
 4 compensations including a first gamma compensation of voluntarily  
 5 giving a luminance characteristic of a reproduced image to an  
 6 input image luminance and a second gamma compensation of making  
 7 suitable to a red transmittance characteristic, a green  
 8 transmittance characteristic and a blue transmittance  
 9 characteristic for an applied voltage of said color liquid crystal  
 10 display to a video red signal, a video green signal and a video  
 11 blue signal independently in order to obtain a compensated video  
 12 red signal, a compensated video green signal and a compensated  
 13 blue signal; and  
 14 a step of driving said color liquid crystal display based  
 15 on said compensated video red signal, said compensated video green  
 16 ~~signal and said compensated blue signal.~~

1 6. The driving method for the color liquid crystal display  
 2 according to Claim 5, wherein said gamma compensations are applied  
 3 using a common voltage or a common data to said video red signal,  
 4 said video green signal and said video blue signal corresponding

09707816-110700

Sub B

5 to an area in which said red transmittance characteristic, said  
 6 green transmittance characteristic and said blue transmittance  
 7 characteristic for said applied voltage for said color liquid  
 8 crystal display become an approximate similar characteristic  
 9 curve.

1 7. The driving method for the color liquid crystal display  
 2 according to Claim 5, wherein voltages or data used for said gamma  
 3 compensations are independently set in an area from a minimum  
 4 transmittance to a maximum transmittance of each of said red  
 5 transmittance characteristic, said green transmittance  
 6 characteristic and said blue transmittance characteristic for  
 7 said applied voltage for said color liquid crystal display.

1 8. The driving method for the color liquid crystal display  
 2 according to Claim 7, wherein said voltages or said data are  
 3 independently changeable.

1 9. A driving circuit for a color liquid crystal display  
 2 comprising:

3 a first gamma compensating circuit for applying a gamma  
 4 compensation of compensating a video red signal so as to be  
 5 suitable to a red transmittance characteristic for an applied  
 6 voltage in said color liquid crystal display and for outputting  
 7 a compensated video red signal;

1 a second gamma compensating circuit for applying a gamma  
 2 compensation of compensating a video green signal so as to be  
 3 suitable to a green transmittance characteristic for said applied  
 4 voltage in said color liquid crystal display and for outputting  
 5 a compensated video green signal;

0070016 110700

Sub  
34

6 a third gamma compensating circuit for applying a gamma  
7 compensation of compensating a video blue signal so as to be  
8 suitable to a blue transmittance characteristic for said applied  
9 voltage of said color liquid crystal display and for outputting  
10 a compensated video blue signal;

11 a reference voltage generating circuit for supplying  
12 respectively reference voltages to said first gamma compensating  
13 circuit, said second gamma compensating circuit and said third  
14 gamma compensating circuit; and

15 a data electrode driving circuit for driving corresponding  
16 electrodes of said color liquid crystal display based on said  
17 compensated video red signal, said compensated green signal and  
18 said compensated video blue signal.

1 10. The driving circuit for the color liquid crystal display  
2 according to Claim 9, wherein said reference voltage generating  
3 circuit supplies a common reference voltage to said video red  
4 signal, said video green signal and said video blue signal  
5 corresponding an area in which said red transmittance  
6 characteristic, said green transmittance characteristic and said  
7 blue transmittance characteristic for said applied voltage in  
8 said color liquid crystal display become an approximate similar  
9 characteristic curve.

1 11. The driving circuit for the color liquid crystal display  
2 according to Claim 9, wherein said reference voltages are  
3 independently set for each area from a minimum transmittance to  
4 a maximum transmittance in each of said red transmittance  
5 characteristic, said green transmittance characteristic and said  
6 blue transmittance characteristic for said applied voltage in

09707816-110700

7 said color liquid crystal display.

12. The driving circuit for the color liquid crystal display according to Claim 11, wherein said reference voltages are independently changeable.

13. A driving circuit for a color liquid crystal display comprising:

a first gamma compensating circuit for applying a gamma compensation to a video red signal, said gamma compensation including a first gamma compensation of voluntarily giving a luminance characteristic of a reproduced image for an input image luminance and a second gamma compensation of compensating said video red signal so as to be suitable to a red transmittance characteristic for an applied voltage in said color liquid crystal display and for outputting a compensated video red signal;

a second gamma compensating circuit for applying a gamma compensation to a video green signal, said gamma compensation including a first gamma compensation of voluntarily giving a luminance characteristic of a reproduced image for an input image luminance and a second gamma compensation of compensating said video green signal so as to be suitable to a green transmittance characteristic for an applied voltage of said color liquid crystal display and for outputting a compensated video green signal;

a third gamma compensating circuit for applying a gamma compensation to a video blue signal, said gamma compensation including a first gamma compensation of voluntarily giving a luminance characteristic of a reproduced image for an input image luminance and a second gamma compensation of compensating said video blue signal so as to be suitable to a blue transmittance

SUBS

00707816-110700

Sub 25

25 characteristic for an applied voltage of said color liquid crystal  
 26 display and for outputting a compensated video blue signal;  
 27 a reference voltage generating circuit for supplying  
 28 respectively reference voltages to said first gamma compensating  
 29 circuit, said second gamma compensating circuit and said third  
 30 gamma compensating circuit; and  
 31 a data electrode driving circuit for driving corresponding  
 32 electrodes in said color liquid crystal display based on said  
 33 compensated video red signal, said compensated video green signal  
 34 and said compensated video blue signal.

1 14. The driving circuit for the color liquid crystal display  
 2 according to Claim 13, wherein said reference voltage generating  
 3 circuit supplies a common reference voltage to said video red  
 4 signal, said video green signal and said video blue signal  
 5 corresponding an area in which said red transmittance  
 6 characteristic, said green transmittance characteristic and said  
 7 blue transmittance characteristic for said applied voltage in  
 8 said color liquid crystal display become an approximate similar  
 9 characteristic curve.

1 15. The driving circuit for the color liquid crystal display  
 2 according to Claim 13, wherein said reference voltages are  
 3 independently set for each area from a minimum transmittance to  
 4 a maximum transmittance in each of said red transmittance  
 5 characteristic, said green transmittance characteristic and said  
 6 blue transmittance characteristic for said applied voltage in  
 7 said color liquid crystal display.

1 16. The driving circuit for the color liquid crystal display

09707816 "110700

Sub 35

Sub 35

3 according to Claim 15, wherein said reference voltages are independently changeable.

1 17. A driving circuit for a color liquid crystal display  
 2 comprising:  
 3 a gradation power supply circuit for generating a plurality  
 4 of red gradation voltages, a plurality of green gradation voltages  
 5 and a plurality of blue gradation voltages used for independently  
 6 applying a gamma compensation to a video red signal, a video green  
 7 signal and a video blue signal in order to compensate said video  
 8 red signal, said video green signal and said video blue signal  
 9 so as to be suitable to a red transmittance characteristic, a green  
 10 transmittance characteristic and a blue transmittance  
 11 characteristic for an applied voltage in said color liquid crystal  
 12 display; and  
 13 a data electrode driving circuit for applying a data red  
 14 signal, a data green signal and a data blue signal obtained by  
 15 applying said gamma compensation to said red data, said green data  
 16 and said blue data and by analog-converting said red data, said  
 17 green data and said blue data based said plurality of red gradation  
 18 voltages, said plurality of green gradation voltages and said  
 19 plurality of blue gradation voltages to corresponding data  
 20 electrodes of said color liquid crystal display.

1 18. The driving circuit for the color liquid crystal display  
 2 according to Claim 17, wherein said gradation power supply circuit  
 3 generates a common gradation voltage to said video red signal,  
 4 said video green signal and said video blue signal corresponding  
 5 an area in which said red transmittance characteristic, said green  
 6 transmittance characteristic and said blue transmittance

09707816-110700

7 characteristic for said applied voltage in said color liquid  
8 crystal display become an approximate similar characteristic  
9 curve.

1 19. The driving circuit for the color liquid crystal display  
2 according to Claim 17, wherein said plurality of red gradation  
3 voltages, said plurality of green gradation voltages and said  
4 plurality of blue gradation voltages are independently set for  
5 each area from a minimum transmittance to a maximum transmittance  
6 in each of said red transmittance characteristic, said green  
7 transmittance characteristic and said blue transmittance  
8 characteristic for said applied voltage in said color liquid  
9 crystal display.

1 20. The driving circuit for the color liquid crystal display  
2 according to Claim 17, wherein said plurality of red gradation  
3 voltages, said plurality of green gradation voltages and said  
4 plurality of blue gradation voltages are independently  
5 changeable.

1 21. A driving circuit for a color liquid crystal display  
2 comprising:  
3 a gradation power supply circuit for generating a plurality  
4 of red gradation voltages, a plurality of green gradation voltages  
5 and a plurality of blue gradation voltages used for independently  
6 applying a gamma compensation to a video red signal, a video green  
7 signal and a video blue signal, said gamma compensation including  
8 a first gamma compensation of voluntarily giving a luminance  
9 characteristic of a reproduced image for an input image luminance  
10 and a second gamma compensation of compensating said video blue

09707816-110700



11 signal so as to be suitable to a blue transmittance characteristic  
12 for an applied voltage of said color liquid crystal display; and  
13 a data electrode driving circuit for applying a data red  
14 signal, a data green signal and a data blue signal obtained by  
15 applying said gamma compensation to said red data, said green data  
16 and said blue data and by analog-converting said red data, said  
17 green data and said blue data based said plurality of red gradation  
18 voltages, said plurality of green gradation voltages and said  
19 plurality of blue gradation voltages to corresponding data  
20 electrodes of said color liquid crystal display.

00707815-110700  
1 22. The driving circuit for the color liquid crystal display  
2 according to Claim 21, wherein said gradation power supply circuit  
3 generates a common gradation voltage to said video red signal,  
4 said video green signal and said video blue signal corresponding  
5 an area in which said red transmittance characteristic, said green  
6 transmittance characteristic and said blue transmittance  
7 characteristic for said applied voltage in said color liquid  
8 crystal display become an approximate similar characteristic  
9 curve.

1 23. The driving circuit for the color liquid crystal display  
2 according to Claim 21, wherein said plurality of red gradation  
3 voltages, said plurality of green gradation voltages and said  
4 plurality of blue gradation voltages are independently set for  
5 each area from a minimum transmittance to a maximum transmittance  
6 in each of said red transmittance characteristic, said green  
7 transmittance characteristic and said blue transmittance  
8 characteristic for said applied voltage in said color liquid  
9 crystal display.

1        24. The driving circuit for the color liquid crystal display  
2 according to Claim 21, wherein said plurality of red gradation  
3 voltages, said plurality of green gradation voltages and said  
4 plurality of blue gradation voltages are independently  
5 changeable.

1        25. A driving circuit for a color liquid crystal display  
2 comprising:  
3        a first gamma compensating section for applying a gamma  
4 compensation to a digital video red signal, said gamma  
5 compensation including a first gamma compensation of voluntarily  
6 giving a luminance characteristic of a reproduced image for an  
7 input image luminance and a second gamma compensation of  
8 compensating said digital video red signal so as to be suitable  
9 to a red transmittance characteristic for an applied voltage of  
10 said color liquid crystal display and for outputting a compensated  
11 digital video red signal;

12        a second gamma compensating section for applying a gamma  
13 compensation to a digital video green signal, said gamma  
14 compensation including a first gamma compensation of voluntarily  
15 giving a luminance characteristic of a reproduced image for an  
16 input image luminance and a second gamma compensation of  
17 compensating said digital video green signal so as to be suitable  
18 to a green transmittance characteristic for an applied voltage  
19 in said color liquid crystal display and for outputting a  
20 compensated digital video green signal;

21        a third gamma compensating section for applying a gamma  
22 compensation to a digital video blue signal, said gamma  
23 compensation including a first gamma compensation of voluntarily  
24 giving a luminance characteristic of a reproduced image for an

00707816-110700

25 input image luminance and a second gamma compensation of  
 26 compensating said digital video blue signal so as to be suitable  
 27 to a blue transmittance characteristic for an applied voltage of  
 28 said color liquid crystal display and for outputting a compensated  
 29 digital video blue signal; and

30 a data electrode driving circuit for applying a data red  
 31 signal, a data green signal and a data blue signal obtained by  
 32 analog-converting said compensated red data, said compensated  
 33 green data and said blue data to corresponding electrodes of said  
 34 color liquid crystal display.

1 26. The driving circuit for the color liquid crystal  
 2 display according to Claim 25, wherein said first gamma  
 3 compensating section, said second gamma compensating section and  
 4 said third gamma compensating section apply said gamma  
 5 compensation to said red data, said green data and said blue data  
 6 by operation processes.

1 27. The driving circuit for the color liquid crystal  
 2 display according to Claim 25, wherein said first gamma  
 3 compensating section, said second gamma compensating section and  
 4 said third gamma compensating section previously hold said  
 5 compensated red data, said compensated green data and said  
 6 compensated blue data which are results of said gamma compensation  
 7 corresponding to said red data, said green data and said blue data  
 8 and said compensated red data, said compensated green data and  
 9 said compensated blue data are read using said red data, said green  
 10 data and said blue data as reference addresses so as to be  
 11 corresponded in order to apply said gamma compensation.

00707816-110700

1        28.    The driving circuit for the color liquid crystal  
2 display according to Claim 25, wherein said first gamma  
3 compensating section, said second gamma compensating section and  
4 said third gamma compensating section independently apply said  
5 gamma compensation in each area from a minimum transmittance to  
6 a maximum transmittance of each of a red transmittance  
7 characteristic, a green transmittance characteristic and a blue  
8 transmittance characteristic for said applied voltage of said  
9 color liquid crystal display.

1        29.    A driving circuit for a color liquid crystal display  
2 comprising:

3            a first gamma compensating section for applying a gamma  
4 compensation to a digital video red signal, said gamma  
5 compensation including a first gamma compensation of voluntarily  
6 giving a luminance characteristic of a reproduced image for an  
7 input image luminance and a second gamma compensation of  
8 compensating said digital video red signal so as to be suitable  
9 to a red transmittance characteristic for an applied voltage of  
10 said color liquid crystal display, said second gamma compensation  
11 including a second gamma slight compensation of executing a  
12 compensation caused by a difference among a red characteristic,  
13 a green characteristic and a blue characteristic and for  
14 outputting a compensated video red signal;

15           a second gamma compensating section for applying a gamma  
16 compensation to a digital video green signal, said gamma  
17 compensation including a first gamma compensation of voluntarily  
18 giving a luminance characteristic of a reproduced image for an  
19 input image luminance and a second gamma compensation of  
20 compensating said digital video green signal to be suitable to

00707816 110700

21 a green transmittance characteristic for an applied voltage of  
22 said color liquid crystal display, said second gamma compensation  
23 including a second gamma slight compensation of executing a  
24 compensation caused by a difference among said red characteristic,  
25 said green characteristic and said blue characteristic and for  
26 outputting a compensated digital video green signal;

27 a third gamma compensating section for applying a gamma  
28 compensation to a digital video blue signal, said gamma  
29 compensation including a first gamma compensation of voluntarily  
30 giving a luminance characteristic of a reproduced image for an  
31 input image luminance and a second gamma compensation of  
32 compensating said digital video blue signal to be suitable to a  
33 blue transmittance characteristic for an applied voltage of said  
34 color liquid crystal display, said second gamma compensation  
35 including a second gamma slight compensation of executing a  
36 compensation caused by a difference among a red characteristic,  
37 a green characteristic and a blue characteristic and for  
38 outputting a compensated digital video blue signal;

39 a gradation power supply circuit for generating a plurality  
40 of red gradation voltages, a plurality of green gradation voltages  
41 and a plurality of blue gradation voltages used to apply a second  
42 gamma rough compensation caused by a similarity among said red  
43 characteristic, said green characteristic and said blue  
44 characteristic to said compensated red data, said compensated  
45 green data and said compensated blue data included in said second  
46 gamma compensation making suitable to said red transmittance  
47 characteristic, said green transmittance characteristic and said  
48 blue transmittance characteristic for an applied voltage of said  
49 color liquid crystal display; and

50 a data electrode driving circuit for applying a data red

09707815 110700

51 signal, a data green signal and a data blue signal obtained by  
52 applying said gamma rough compensation to said compensated red  
53 data, said compensated green data and said compensated blue data  
54 and by analog-converting said compensated red data, said  
55 compensated green data and said compensated blue data based on  
56 said plurality of red gradation voltages, said plurality of green  
57 gradation voltages and said plurality of blue gradation voltages  
58 to corresponding electrodes of said color liquid crystal display.

1 30. The driving circuit for the color liquid crystal  
2 display according to Claim 29, wherein said first gamma  
3 compensating section, said second gamma compensating section and  
4 said third gamma compensating section apply said gamma  
5 compensation to said red data, said green data and said blue data  
6 by operation processes.

1 31. The driving circuit for the color liquid crystal  
2 display according to Claim 29, wherein said first gamma  
3 compensating section, said second gamma compensating section and  
4 said third gamma compensating section previously hold said  
5 compensated red data, said compensated green data and said  
6 compensated blue data which are results of said gamma compensation  
7 corresponding to said red data, said green data and said blue data  
8 and said compensated red data, said compensated green data and  
9 said compensated blue data are read using said red data, said green  
10 data and said blue data as reference addresses so as to be  
11 corresponded in order to apply said gamma compensation.

1 32. The driving circuit for the color liquid crystal  
2 display according to Claim 29, wherein said first gamma

09707816-110700

3 compensating section, said second gamma compensating section and  
4 said third gamma compensating section independently apply said  
5 gamma compensation in each area from a minimum transmittance to  
6 a maximum transmittance of each of a red transmittance  
7 characteristic, a green transmittance characteristic and a blue  
8 transmittance characteristic for said applied voltage of said  
9 color liquid crystal display.

09707816 110700